

NEW HORIZONS IN INDUSTRIAL HEALTH

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New horizons in industrial health is a term that can have a variety of meanings depending on the point of view of the persons affected and the interest of the professional discipline involved. Passage of the Federal Coal Mine Health and Safety Act of 1969 created a new horizon for the

coal miner. The coal mine operators, however, didn't exactly see a new horizon; they saw storm clouds and higher production costs. Such a reaction to new legislation is not unusual. Several years later, however, coal is still being mined, profitably so and in greater tonnage than ever before. The dust levels in the mines are being controlled, and the mines are becoming safer.

The Occupational Safety and Health Act of 1970 represented a new horizon for all workers and has a potential of opening up many new horizons to the various disciplines in occupational safety and health. New horizons on the legislative front have been appearing with increasing frequency, and legislation is sure to be introduced in the 93d Congress relating to occupational safety

and health. We can expect a reappearance of the Steiger amendment, the Toxic Substances Control Bill, amendments to the Metal and Nonmetallic Mines Act, and bills to improve workmen's compensation.

New Horizons for Professionals

To the various professionals in occupational safety and health, many new horizons have appeared of late. The industrial hygienist now has a spectacular array of sampling and monitoring equipment; noise dosimeters are available; and most respirable dusts are being evaluated by gravimetric means. There are a greater number of instruments capable of making direct readings so that less time is needed in the laboratory for analysis.

Because of the shortage of professionals in industrial hygiene, I believe there will be two different kinds of approaches to the use of professional manpower. In one, the professional industrial hygienist will head a team of technologists and technicians whose sampling he will direct and whose results he will interpret. In the other approach, use will be made of a person less highly trained in industrial hygiene who has been more generally trained in safety. This is the kind of professional that the National Institute for Occupational Safety and Health (NIOSH) calls an occupational safety and health professional and whom the Occupational Safety and Health Administration of the Department of Labor calls a generalist.

Enforcement agencies could use this type of professional for both occupational health and safety. Employers should be interested because of the economy of hiring one professional rather than two. The Soviet Union is far ahead of us in training such professionals, and in the forthcoming health interchange between the Department of Health, Education, and Welfare and the Soviet Ministry of Health, close attention will be paid to the training and practice of the occupational safety and health generalist.

For the occupational health nurse, also, the opening of new horizons will mean a change in her traditional manner of practice. Many industrial nurses already operate without the direct guidance of a physician, and in the future I believe this practice of independence will increase. The occupational health nurse's responsibilities are also likely to increase so that she will be performing many duties now performed by the plant

physician. In other words, she could become an occupational health practitioner, a position which, along with the physician's assistant, would afford one of the various routes for advancement in the medical care system.

New Medical Horizons

There will also be new medical horizons. Many occupational health physicians who were trained in the post-World War II era believed that the major discoveries had been made, that occupational diseases and their prevention were well defined, and that all they had to do was apply what was already known. One of our predecessor organizations, the old Division of Industrial Health of the Public Health Service, had criss-crossed the country studying employed populations, and the problems of such groups were defined epidemiologically, medically, and environmentally.

The technological and economic growth of the fifties and sixties, however, has convinced us that we can always expect new occupational diseases to occur in heretofore unsuspected employed groups. This assumption proves all the more valid when two points are considered. One is that a prodigious number of chemical substances are produced and used in this country—some half million according to a recent estimate of the National Academy of Sciences.

Beilstein's *Handbuch der organischen Chemie* listed some 100,000 organic chemicals back in the 1930s. About 3,000 new chemicals are synthesized each year, and 200 to 500 of these find some use in industry.

The other point to be considered is that we will be looking for less dramatic effects of occupational exposure than acute poisonings or chronic dust diseases of the lungs. As directed by the Occupational Safety and Health Act, we will be seeking any evidence of diminished health, functional capacity, or life expectancy that results from work experience. In most cases these subtle effects will be difficult to detect because of their similarity or correspondence with nonoccupational diseases, especially the degenerate diseases of aging. The subtle decremental effects are impossible to define precisely in one person; they can only be demonstrated through epidemiologic studies of exposed and control populations.

Exposure to chemicals and fumes in dyeing operations is one of the many occupational hazards of concern to NIOSH



In line with these two points, the Occupational Safety and Health Act directed the Secretary of Health, Education, and Welfare, under section 20(a)(4), to "conduct special research, experiments, and demonstrations relating to occupational safety and health as are necessary to explore new problems, including those created by new technology in occupational safety and health . . ."; under section 20(a)(5), "to establish such programs of medical examinations and tests as may be necessary for determining the incidence of occupational illnesses and the susceptibility of employees to such illnesses"; and under section 20(a)(7), to "conduct and publish industrywide studies of the effect of chronic or low-level expo-

sure to industrial materials, processes, and stresses on the potential for illnesses, disease, or loss of functional capacity in aging adults."

Implementation of the 1970 Act

Although the National Institute for Occupational Safety and Health was given a 2-year period in which to begin industrywide studies, we have gotten a head start in that a number of these had already been initiated by the old Bureau of Occupational Safety and Health. In the President's first report on Occupational Safety and Health prepared in May 1972, we were proud to report 22 NIOSH industrywide epidemiologic research studies of several hundred thousand workers in a variety of industrial classifications, including



Industrial hygienist using electrostatic precipitator to obtain sample from the fumes that result from a brazing operation



Field studies and clinical investigations of workplace hazards are major functions of NIOSH

printing pressmen, foundry workers, construction machinery operators and stationary engineers, woodworkers, dentists, machinists, cotton textile workers, steelworkers, cosmetologists, asbestos workers, beryllium production workers, uranium miners and millers, cotton ginners, granite workers, and operating room personnel.

Some of these studies have already ended, such as those of asbestos and beryllium workers, and will soon be reported. Some are just beginning, and some are well underway. Since the President's report was published, we have initiated industrywide studies of several carcinogens, including bis-chloromethyl ether, which appears to be one of the most potent carcinogens yet discovered. Some of these industrywide studies will be made indepth and will consist of both medical and environmental components; some will entail only a study of records, and others will be partial in that not all of the major industries in which a suspected hazard occurs will be studied.

We do have limitations, of course—limitations imposed by restraints on budget and personnel, by restrictions on grade points, and by shortages of mobile equipment. In spite of these handicaps,

the National Institute for Occupational Safety and Health has undertaken a large number of studies based on current priorities and on the ability to produce results with given resources. The Institute has a formal mechanism for determining research practices based upon the relationship of variables, such as numbers of workers at risk, severity of the hazard, and so forth.

Much use is being made of the contract mechanism, and we hope that in the future we can put more resources into this activity and increase the number and variety of industrial groups studied. A number of suggestions have been received from the various craft and industrial unions for new initiatives in field studies. As a matter of fact, we have received suggestions from the Labor Conference of the National Safety Council that we do a special study on workers exposed to fluoride emissions and to iron oxide. In our current listings of priorities, fluorides are in the 6th priority grouping, and iron oxide is in the 17th.

One of our current projects on respiratory disability and lung cancer among diverse hard-rock miners includes a small number of iron ore min-

ers. The study was done because of reports of increased cancer among iron miners in England, and also in this country. The Metal Trades Department of the AFL-CIO has asked for industrywide studies on welding and cutting and the industrial use of lasers. The International Brotherhood of Electrical Workers has expressed interest in having NIOSH conduct a study of the hazards to high voltage linemen who use barehanded techniques.

While enumerating requests from labor sources, I should also mention the operating engineers, the printing pressmen, and the carpenters and joiners. We are cooperating with all of these workers in a cross-sectional comparison of their cause-specific proportional mortality with that of the general population. This study could lead to exploratory research into the association between on-the-job exposures and manifestations of disease. These studies are essentially based on records—the death benefit files of the various unions.

Another union request, which goes back to the days of the old Bureau of Occupational Safety and Health, is a proposed foundry study, requested by the United Auto Workers. This study, which will also be based on records, is just now getting underway.

Sometime soon the National Institute for Occupational Safety and Health will have to initiate an industrywide study into agricultural health and safety hazards. The background information for this study is being obtained through a contract with the University of Iowa and through surveillance activities of NIOSH's Office of Health Surveillance and Biometrics. Under this contract with the Institute of Agricultural Medicine of the university, we are collecting comprehensive background data in the agricultural health and safety field, including (a) information on the characteristics of different agricultural regions and practices and the types of hazards found in each, (b) the extent to which knowledge is available for control of these hazards, (c) the resources presently available throughout the country that can be brought to bear on these problems, and (d) recommendations for future activities by government and private agencies. This state-of-the-art assessment is urgently needed and will form the cornerstone upon which we can build a long-range health and safety program. We expect to have this review completed by the summer of 1973.

To provide more detailed information on agricultural hazards, the NIOSH Office of Health Surveillance and Biometrics plans to conduct an

onsite survey of a cross-section of agricultural workplaces. This survey will provide basic descriptive information on the specific nature of agricultural hazards and serve as a guideline for setting priorities for industrywide studies and for further research and the development of standards.

There is another industrywide study that NIOSH will eventually have to consider, but one that could be highly controversial; I do not want to divert to this study any present sources, which are already fully committed. Perhaps the research grant mechanism would be a more suitable mechanism for conducting the study. I refer to a gray area between occupational and nonoccupational illnesses—the relationship between job stresses and the initiation or aggravation of nonoccupational illnesses, such as peptic ulcer. Because of the variables of individual susceptibility, seasonal incidence, and job stresses, this study would have to be conducted on relatively large groups of stressed and nonstressed work populations, and uniform diagnostic criteria would have to be used over a long period.

Requests for Studies

The requests for studies will always be greater than our ability to respond, so that delays can be expected. Meanwhile it should be remembered that NIOSH's hazard evaluation services are available to all workers who come under the jurisdiction of the Occupational Safety and Health Act; we can initiate these evaluations upon request without waiting for an industrywide study.

The final regulations for the conduct of hazard evaluations appeared in the Federal Register in December 1972; request forms have been widely distributed throughout HEW Regional Offices and to a large number of other possible sources of evaluation requests. We are in the process of formulating proposed regulations for NIOSH industrywide studies. These regulations will set up a mechanism for direct input from management and labor groups into the planning and conduct of these studies.

The National Safety Council and similar organizations are an important source of input to us for industrywide studies. Requests for studies should be documented. Since our operations are conducted on the basis of priority, we need information on the number of workers who will potentially be affected and on the nature and severity of the problem.